

Association for Information Systems AIS Electronic Library (AISeL)

AMCIS 2002 Proceedings

Americas Conference on Information Systems
(AMCIS)

December 2002

CUSTOMER WEB INTERACTION: FUNDAMENTALS AND DECISION TREE

Enrico Senger
University of St. Gallen

Sandra Gronover
University of St. Gallen

Gerold Riempp
University of St. Gallen

Follow this and additional works at: <http://aisel.aisnet.org/amcis2002>

Recommended Citation

Senger, Enrico; Gronover, Sandra; and Riempp, Gerold, "CUSTOMER WEB INTERACTION: FUNDAMENTALS AND DECISION TREE" (2002). *AMCIS 2002 Proceedings*. 270.
<http://aisel.aisnet.org/amcis2002/270>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2002 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

CUSTOMER WEB INTERACTION: FUNDAMENTALS AND DECISION TREE

Enrico Senger, Sandra Gronover, and Gerold Riempp

Institute of Information Management

University of St. Gallen

enrico.senger@unisg.ch sandra.gronover@@unisg.ch

gerold.riempp@unisg.ch

Abstract

In order to utilise the new possibilities of Internet technology efficiently, many companies invest considerable sums in the development of communication channels to customers. In this context, the often-quoted objective of cost saving per interaction appears to be questionable, since new communication media have not been able to fully substitute the existing systems. Costs are therefore more likely to rise than drop.

The following article discusses potentials, criteria, conditions and consequences related to the use of computer-mediated environments for customer interaction. The objective is to derive recommendations for action in respect of a context-dependent support, especially by means of web collaboration and self-service-options.

Introduction

Today's fast-paced world is increasingly becoming characterised by technology-facilitated transactions and communication. Various information systems enable growing numbers of customers to obtain information or to fulfil transactions instead of interacting face-to-face with a company employee. Nevertheless, people apparently trust intelligent information systems, such as voice portals or web-bots, less than natural persons (e.g. (Åberg et al. 2000), (Mühlfelder et al. 1999)). From an economic point of view, however, personal contact is not always sensible or feasible.

This paper concentrates on interactions between companies and their customers. The challenge is to orientate electronic business contacts to the needs of customers. A customer doesn't pick up his bank statement at a specific office anymore, but rather at a printer for bank statements or at the Internet. But he expects an intensive personal advising on his real estate financing.

Companies in the business-to-consumer sector particularly need to answer the following questions. How do I adapt the customer interaction to human communication behaviour? Which media are suitable for which business processes? Who can theoretical knowledge be transcribed into praxis? How this dilemma can be solved and which systems should be utilised when, and to which extent? The requirements expected from interaction systems can be derived from empirical results delivered by the social sciences in particular. Nass and Lee, for instance, proved that customers are more likely to trust language computers if these possess "personality features" (e.g. voice modulation) similar to that of the users (e.g. (Nass et al. 2001), (Morkes et al. 1999)).

The objective of the work at hand is to systematically record all relevant factors of decision and the critical factors of success and therewith to support the construction of a commercially driven interaction system for practitioners as well as for scientists. First of all the economic significance of communication is described (Section 2), whereupon the different interaction types are classified (Section 3). Focussing on web-based, multi-media interaction a state-of-the-art description shows current developments (Section 4). A generalised decision tree is thereafter derived from the action research methods as applied in co-operation with companies in the financial industry (Section 5). Subsequently, the findings are shortly summarised (Section 6).

Business Implications of Human Communication

In order to offer customer-benefiting products and services in market cycles, companies should not only utilise the potentials of information and communication technology, but should rather cultivate co-operative relations with the customers along the customer buying cycle and the customer processes (Österle 2001). This would shift the focus from a product-centric to a customer-centric view (Read 2000). Besides products and services a customer-centric view also includes the types and style of communication.

The relationship aspect in human communications often has a direct influence on financial success (Watzlawik et al. 1967). The choice of communication media considerably influences the result of a business relationship (customer satisfaction, realised turnover, trust in the business partner etc.), much like the manner of communication with the customer him- or herself does (e.g. Åberg et al. 2000), (Purdy et al. 2000), (Sauer et al. 2000)).

From the social sciences perspective, human communication or interaction¹ mainly serves as the manifestation of human relations (Watzlawik et al. 1967, p. 22). Communication is thus influenced by intra-personal and interpersonal factors. Watzlawik reduces the complexity of human communication to its pragmatic effects by deriving rules for it (e.g. (Watzlawik et al. 1967), (Delhees 1994)).

This starting-point may not serve as the basis for a business management communication model, but it does seem particularly suited as the basis for an interaction management model, since it allows the derivation of instructions for interactions with the customer.² The goal of the latter would be promoting desired customer behaviour (Wigand et al. 1997). Consequently, Watzlawik's five axioms pertaining to human communication are discussed and their meaning determined from an information technology and business management perspective.

One Cannot Not Communicate

Human communication cannot be negated. No answer is therefore an answer in itself. The broad permissible extent of interpretation (e.g. no interest in the customer, nobody knows the answer etc.) leaves room for misinterpretation and can thus disturb the relationship with a customer (Watzlawik et al. 1967, p. 50-53).

A swift reaction to each customer communication is therefore mandatory for successful interaction management (possibly by merely pointing out that the processing of a request will be delayed). The speed with which interaction occurs demonstrates the esteem in which the customer is held by the company. Consequently, web sites that offer an option to return contact, but has the recipient waiting in vain for a response, are counterproductive.

Every Communication Has Both a Content and Human Relationship Aspect

Every message contains, besides its factual content, indications on how this message is to be interpreted. An irrelevant question regarding the authenticity of a pearl necklace inevitably carries a definition of the relationship between the person posing the question and the person wearing the necklace. This definition could be one of admiration, interest, envy, disparaging allegations etc. (Watzlawik et al. 1967, pp. 53). It therefore becomes clear that communication can occur superficially on a content level, whereas it is, in fact, the definition of the human relation between one another (such as status, prestige etc.). One can very often observe that a dispute apparently dealing with factual questions, actually constitutes a lack of agreement on the mutual definition of the relationship (Delhees 1994, pp. 15).

¹The terms "communication" and "interaction" cannot be clearly differentiated from each other in this context and will therefore be treated as equivalent in the following text (see also Delhees 1994, p. 12).

²Nevertheless, there are more media and communication theories suited as starting point (see e.g. Karmarsin/Winter 2000, McQuail/Windahl 1999, Lengel/Daft 1988).

As a result, the choice of the medium of communication and the form of its utilisation do not only depend on the answering of factual questions. They must also take the definition of the human relationship into consideration. For example, some customers may feel that a very informal tone in an e-mail message is disrespectful.

Sequences of Communication Follow a Certain Punctuation

This axiom contradicts the common view of communication constituting an unambiguous, sequential succession of various actions by the partners of interaction. In effect, it is closer to the truth that the perceptions of cause-and-effect relations are subjective. Each partner of communication understands his behaviour as being the reaction to the other person's behaviour. This can lead to an escalation of conflict, whereby each party perceives itself as the "victim" (Watzlawik et al. 1967, pp. 57).

Interaction management must therefore ensure that escalating communication sequences between the company and the customers are buffered. In the case of an unreasonable customer complaint, it is, for instance, often more sensible to demonstrate goodwill rather than insisting on one's own viewpoint.

Communication Utilises Digital and Analogous Modalities

Apart from the so-called digital communication by means of the spoken and written language, there is also a multitude of analogous forms of communication (Watzlawik et al. 1967, pp. 61). These address all human senses and include, for instance, body language, tone level, style, appearance, eye contact or types of fragrance used. On the factual level, digital communication is emphasised. On the relational level, analogous communication dominates (Watzlawik et al. 1967, pp. 63).

Media-supported communication between the customer and the company necessarily leads to a renunciation of analogous communication elements and shifts their evaluation. If, for instance, a customer speaks to an employee whom he does not know on the phone, the tone level, the volume and the language skills gain in importance in comparison to these in a personal interaction. A decrease in the possible analogous communication elements leads to a much lower level of trust being built up between, for instance, two video conference participants who do not know each other than would be the case in face-to-face communication (Mühlfelder et al. 1999). It is therefore an important interaction management task to choose the communication channels in such a manner that the exchange of analogous communication elements is sufficiently enabled.

Communication Takes Place Either Symmetrically or Complementary

Symmetrical communication occurs between communication partners who view each other as equal and is characterised by the partners striving for equal ranking. If, on the other hand, the partners complement each other and there is a clear role allocation (e.g. parent and child, doctor and patient), one speaks of complementary communication. Symmetrical communication relations can escalate through a dispute about power and competence. Complementary relations can escalate through an extreme emphasis on the superior or inferior position of the communication partners (Watzlawik et al. 1967, pp. 68).

Customers desire symmetrical business relations that emphasise equality (Schultz et al. 2000). If a computer expert calling a hotline, for instance, is initially asked whether the computer is really switched on, a successful removal of the problem may possibly not lead to complete customer satisfaction, because the caller might consciously or subconsciously feel that his competence has been questioned.

Interaction Types

Interaction types have a differing spectrum of perception as to how many digital and analogous communication elements can be utilised simultaneously. The extent of a perception does not only influence the exactness of communication, but also the perception of the messages themselves (McCullough Johnston 2001). Consequently, a classification of the different interaction types is developed below.

The interaction between company and customer can be classified according to different criteria (see Table 1). One can therefore differentiate between human-machine interaction, personal (face-to-face) and media-supported communication. Media-supported

communication allows the interaction between physically separated individuals and thereby expands the circle of potential communication partners. Personal (face-to-face) communication is always synchronous, i.e. the interaction of the persons occurs in real time. A person cannot withdraw from communication with another person within the same room or space (compare Section 2). Media-supported communication also allows asynchronous types of interaction. The steps of interaction may be drawn out over a certain time span, such as in a correspondence via postal mail, e-mail, SMS etc.

Personal contact allows for the most intense interaction. All verbal and non-verbal forms of expression are principally at the communication partners' disposal during a direct conversation. Media-supported interaction is, in comparison, characterised by a reduced spectrum of perception.

Media-supported forms of communication have analogous communication that is only possible to a very limited extent in common (e.g. (Purdy et al. 2000), (Nicol et al. 2000)). Multimedia applications, such as video conferences or web collaboration, bundle several means of communication (language, text, image etc.). They allow an interaction comparable to personal communication, due to a broader spectrum of perception (Sauer et al. 2000), although the ability to adapt the interaction to the customer type and behaviour is disturbed. A symmetrical communication is therefore hard to achieve. For the customer relationship this means a higher potential for escalation, because the danger of misunderstandings is increased by the limited spectrum of perception (compare Section 2). This could lead to the customer relationship being terminated.

The given classification raises the question how the interaction types can be employed cost-effectively in the economy. The costs of interaction become less for a sufficiently large number of interactions as one moves from personal communication to media-supported human communication and to human-machine interaction. However, personal communication will continue to maintain its superior significance in future. This is particularly valid for the interaction with those customers who have a high customer value for the company. Mass customers, however, should be dealt with in a media-supported manner, if possible.

Table 1. Classification of Interaction Types

Partners of Interaction	human			machine	
Forms of Interaction	personal	media-supported			
Synchronicity	synchronous	synchronous	asynchronous	synchronous	asynchronous
Extent of Analogous Communication	large	medium	low	very low	very low
Extent of Digital Communication	medium	high	high	very high	very high
Potential for Escalation	medium	high	very high	very high	very high
Adaptation Ability	very high	high	high	low	low
Focus on Customer	high value customer	mass customer	mass customer	mass customer	mass customer
Focus of Action	consultation, negotiations	time-critical information, transactions	standardised information	self-service	simple information
Examples	<ul style="list-style-type: none">personal conversation	<ul style="list-style-type: none">video conferencescreen sharingtelephonechat	<ul style="list-style-type: none">lettere-mailSMS	<ul style="list-style-type: none">IVRvoice portalself-service assistantself-service machines	<ul style="list-style-type: none">auto SMS responseauto e-mail response

Customer Web Interaction

Interaction based on multimedia technologies offers a broader perception range compared to language-based or vocal-based communication forms. Multimedia technologies³ are characterised by a combination of text, language and images and their extension is primarily enabled via the Internet. They might have the potential to achieve a cost-effective and efficient customer communication by using the whole perceptive spectrum. Next the improvement of multimedia-supported personal communication (web collaboration) and the provision of a self-service structure via a human-to-machine-interface (self-service interaction) as well as their usability will be discussed from an interaction management viewpoint.

Web Collaboration

Interaction across a long distance was traditionally carried out by either telephone (language) or letter (text). Currently, the development of Internet technology allows us to combine these media of communication. Based on Internet technology, products such as Lotus Sametime allow physically separated users to virtually work on one screen (screen sharing), to simultaneously exchange messages via instant messaging, or to speak to each other via Internet telephonic services (Voice-over-IP).⁴ The transfer of images and sound in real time, so-called videoconferencing, allows new forms of co-operation. Multimedia interaction, but also individual Internet-based, text-related and language-related interactions create new network environments that are summarised by the term “web collaboration”.

In this way, multimedia interaction gets closest to the spectrum of perception that is part of personal conversations. Voice and images can transport emotions and can emphasise important, non-verbal statements (Delhees 1994). However, these analogous communication contents are only transported in a weakened form owing to, firstly, the reduction in the dimensions of space on a two-dimensional screen and, secondly, to a muffling of the analogous communication due to the fading out of individual senses (e.g. the sense of smell, but not communication style). The fact that there is a weakened communication depth is, however, not always a disadvantage, since negative impressions too are perceived and remembered in a weakened manner (Nicol et al. 2000). For interaction management it is therefore interesting to clarify which technical means of communication should be utilised for which forms of communication.

The text-based form of communication is particularly suitable for the transfer of facts. Its strengths lie in the clear focus on the essentials and, simultaneously, on its strong orientation on the task. In this context, Sauer proves that a well-structured, simple problem can be solved more quickly and accurately by means of a web-based chat rather than via a personal contact (Sauer et al. 2000). Not only can standard requests be answered by instant messaging, but simple consultations are also possible. During main office hours the company E-TRADE Mortgages (E-Trade 2001) offers web-chat-sessions with qualified consultants. According to the service manager, customers particularly value this offer because it provides answers immediately. The consultants are always available, each for a certain time on a rotating system, and can work on several chat sessions simultaneously. In addition to instant messaging, common web collaboration tools offer a screen-sharing option. Through this option, the session participants can view and work on the same screen at the same time. This functionality is particularly practical as far as more complex problems, such as in software support, are concerned (Beresford 1999).

The influence of visual components in an interaction grow in proportion to the complexity of an issue. The previously mentioned study by Sauer also proved that the application and transfer of knowledge are easier for those persons who receive this knowledge personally or via videoconferencing. In this context, it is assumed that analogous elements of communication emphasise their meaning and relationship to individual matters (Sauer et al. 2000). However, it was also proven that trust is not built between conversation partners who do not know each other. Mühlfelder evidenced that in videoconferencing less trust arises between partners who are strangers to each other than does in face-to-face communication (Mühlfelder et al. 1999). The initiation of customer contacts, complex consultation services and contract negotiations are therefore areas in which direct personal contact cannot be substituted by media-supported communication.

³A differentiation between visual forms of expression in text and image is based on surveys according to which there are different processing mechanisms for text and images in the human brain (McCullough Johnston 2001).

⁴The utilisation of the Internet for telephonic purposes (so-called Voice-over-IP, VoIP) has considerable economic potential. Current VoIP starting-points concentrate on the transfer of language data services within the company network.

Web collaboration is currently mainly linked to a personal computer as a user interface. In future however, customers may want to satisfy their needs at anytime and anywhere. Therefore, an increasing number of requests will be handled by mobile devices in order to satisfy the customers' need for non-delayed and direct interaction. Chat modes, such as those developed by NOKIA for mobile phones, are the first steps in this direction.

Self-Service Interaction

Web applications that totally automatically support customers in some activities are especially attractive to companies in the mass market. These applications can help save costs in the service area and can be termed self-service assistants. A survey among e-business executives showed that there is an ambivalence towards self-service functions (Morrell 2000). These "intelligent" information systems offer a user interface for interaction with the customer, be it for the obtaining of information, the purchasing of products and services or their utilisation.

It can be proven that implementing self-service assistants has a positive influence on the purchasing decisions of the customer (Häubl et al. 2000). This positive influence is due to, amongst other reasons, the increased browsing time and concentration during the visit to an Internet web site with an "intelligent" self-service support (Meuter et al. 2000). The interaction occurs more symmetrically (compare Section 2) than before, because the customer not only consumes information, but also obtains feedback adapted to the context of the situation, much like in a personal conversation.

The "intelligence" which self-service systems can display varies with each target of the interaction support. Pure transaction-orientated systems, such as cash dispensers, possess a relatively low interaction logic. The same applies to so-called "guided tours" that hardly offer any interaction options at all. Both services combine image and language in order to explain the structure of a web site in as focussed a manner as possible (DaimlerChrysler AG 2001), or in order to introduce processing procedures (eBay GmbH 2001). The customer's attention is thus guided by means of an arrow pointed at individual elements of the page and then by linguistically explaining the meaning of individual elements. However, it must be noted that the user may be bored by the lack of interactivity and may abort this option.

The trend is set for complex "intelligent" user interfaces or self-service assistants which are characterised by learning abilities, reactivity and an autonomous, targeted fulfilment of tasks (Nwana 1996). The terms "avatars" or "web-bots" are used for "intelligent" information systems that are characterised by a virtual pseudo-personality of their own. They are represented by computer animated figures or images of real persons. Avatars are utilised to represent the company in a customer action. The SRCT theory (Social Response to Communication Technologies) argues that when communicating with computers, humans behave just as they would when communicating with other humans. Avatars leverage this statement by representing a virtual communication partner with certain human features (e.g. facial expression). Even though the results of Morkes' research could not entirely confirm this theory, the "personification" of machine communication partners appears to have a positive effect on the quality of the man-machine interaction (cf. (Kolko 1999), (Morkes et al. 1999)). Speaking avatars that, depending on the questions posed, change the structure and the navigation of the web site, constitute an element of the latest development in this field. The avatar "Eve" of the Yellostrom company (www.yellostrom.de), for instance, opens the relevant page in answer to a question on the customer application form.

Beside avatars, other "intelligent information systems" without virtual personality are increasingly being utilised in the customer interaction field. Intelligent information systems can be used as context-based navigation aids. They adapt the navigational options on web sites to the user behaviour by, for instance, learning the user preferences, or by analysing the search context from the surfing history of the customer (MIT 2001). Libuda offers an illustrative example of the potential of multimedia user interfaces (Libuda 2001). He describes a user interface that he and the BMW AG company jointly developed for one of their vehicles. The user has three independent input options at his disposal: language, manual mode and signs. BMW's iDrive is a starting point for this extensive concept (Horvitz et al. 2001).

In contrast to those user interfaces that link the real user and the real company (or its product), there are also self-service information systems that create virtual rooms. Here the focus lies on the transfer of knowledge. This knowledge is often in the form of multimedia content that is not automatically generated. Examples of such content are multimedia courses available via the Internet. The contents of these courses are engineered by humans, the task of the information system is to present the contents at a time desired by the customer. The internal logic of these systems must therefore not be as complex as that of avatars and other intelligent user interfaces is. Companies such as Microsoft (Microsoft 2001) and ENEN (ENEN 2001) offer the option of attending

virtual seminars on individual products or relevant topics. The material is transferred to the visitor by means of video broadcasting and sound. This is supported by presenting the essential concepts on charts that change during the course of the seminar.

Surveys have proven that a significant number of online purchases are aborted because the customers do not receive satisfying and/or soonest responses to their questions (Wagner 2000). It is therefore advisable to support the man-machine interface by media-supported, direct interaction using “call me” buttons or similar options.

Rules and Critical Success Factors for the Selection of Interaction Media

In this chapter a decision tree that supports the selection of suitable tools for customers’ web interaction is derived. It structures the characteristics of human communication and interaction systems that are available at present. The development of this decision tree follows the scientific approach as recommended by Ulrich (Ulrich 1984). His criterion for successful research is the practical problem-solving ability of the developed models and methods. In this tradition of action research, Österle created a research process for the information management field that is based on the collaboration between scientists and practitioners ((Österle et al. 1993, pp.13-16), (Alt et al. 2002, pp. 9-11).

Based on this research approach representatives of six Swiss and German enterprises of the financial services industry (AGI Cooperation & IT Services, Credit Suisse, Helsana Versicherung, Landesbank Baden-Württemberg, Union Investment, Winterthur Insurance) participated in the development of the decision tree presented subsequently. Based on an in-depth preparation, the special challenges they faced were discussed within the scope of a workshop and the reached results were examined in practice.

Challenges of Customer Interaction in the Financial Industry

A feature of the financial service industry is the high homogeneity of the offered services. The goods and services are seldom unique, for example, account management is offered by nearly every retail bank. The presentation of value added services will therefore be decisive for the success. A facet of customer satisfaction is, besides e.g. the quality and the price of goods and services, the variety of interaction that is offered.

Enterprises in the financial services industry ask themselves what kind of customer interaction should be offered in the mass market. Communication issues in this line of business can be essentially divided into five scopes: Request for information, counselling, claims, transactions and user support for the provided e-banking solutions. To date most customers prefer the personal interaction provided in branches or via sales representatives. But this kind of customer interaction is too expensive and cannot fit all customer requirements, such as service 24-7, properly.

Following the classification of interaction types (Section 3) a smooth transition to a media-mediated form of communication should be achieved. Customer expectations concerning the quality of media-mediated interaction have been increasing continuously over the past few years (Morrell 2000). For example, an extended handling period or unsatisfactory responses in terms of content or formal style may disturb the customer relationship. Employees’ communication style and eloquence when dealing with customers are quite significant. Beside trainings and quality checks, other starting points for the improvement of the interaction quality can be identified:

- Ensure an adequate response time by defining service agreements, such as a maximum of 24 hours within which a reply must be given to an e-mail request, or that transactions should be conducted in real time. Proper rules of responsibility and substitution are necessary, as well as a mechanism of escalation, such as notifying one’s supervisor.
- With a symmetrical communication (Section 2) as goal, the interaction should be adapted for the different customer segments. A corporate tonality, including rules and regulations concerning the communication style, may help employees interact with customers. This is of particular importance to media-mediated communications, because of its higher potential for escalation.

Enterprises in the financial services industry should question themselves regarding the extent to which customer interaction could be improved by using multi-media technologies. Based on business requirements and the technical maturity (Section 4), three possible implementation scenarios have been identified: Communication via voice-portals, web-bots and a web-based personal interaction via chat- and screen-sharing modules. The usability of these technologies was part of a survey carried out by the authors of this paper together with the named enterprises.

In the beginning, automated voice-portals seemed to be well qualified to support heavily structured customer requests, such as the demand for marketing brochures or standardised information. Theoretically the use of natural language seemed to be convenient for customers and therefore the evaluation started with high expectations. Contrary to the expectations, the tested automated voice-portals did not understand natural language correctly. This led to frustration and a swift escalation of interaction, since this was a complementary communication style (Section 2).

- Web-bots (or avatars) survived the test as far as the reply to standardised customer requests was concerned. The advantages of these technologies are the advanced support supplied by symmetrical communication and the intelligent user support, for example by adapting the user-interface to suit the question. While evaluating existing solutions, it was realised that the simulation of emotions, like smiling, has positive effects on the duration and the emotional involvement of the test persons. The answers given by the web-bot are only satisfying if they contain standard modules. If there is a strong variation in the standard context, the answers are unsatisfactory. In the latter case, some web-bots automatically initiate a web-based interaction with contact-centre agents.
- The communication in difficult and complex matters was identified as an additional area of operations for media-mediated interaction by the representatives of the participating enterprises. Detailed requests, claims and the technical support are areas of specific concern and here employee competence cannot be replaced by machines. The potential of web collaboration and screen sharing in this field is impressive, especially in the field of technical helpdesk support.

To improve the efficiency of interaction, the following guidelines have been derived: The technical development of automated voice-portals is not satisfactory for use in the current business environment. Interaction via web-bots (primarily standardised requests) and using web-collaboration tools (detail information, claims and technical helpdesk functions) successfully increase the interaction portfolio.

Derivation of a Generalised Decision Tree

The generalisation of decision variables and critical success factors developed in co-operation with the named firms, leads to a decision tree that helps to evaluate different interaction systems. Figure 1 focuses on multimedia applications and specifies critical success factors for a favourable customer interaction on each level. The decision tree provides clues for evaluation, but cannot replace a detailed, case-based, in-depth study. Starting with customer interaction the following decision nodes have to be regarded:

- medium-supported interaction versus face-to-face communication
- multi-media interaction systems versus mono-media interaction systems and
- web collaboration versus web self-service

These decision variables and the appropriate critical success factors (CSFs) result from the consideration of the financial effects of communication (Section 2) and their transfer to different interaction types (Section 3). The leaf nodes of the decision tree represent the interaction types described in Section 4.

Customer interaction with particularly valuable customers, or in highly complex matters should be in the form of face-to-face communication due to its broader perception spectrum (Section 2). An exception to this rule would be scenarios with spatially or temporally separated communication partners; in all other cases mediated communication should be preferred. Critical success factors are the required technological equipment and the customer's ability to use the interaction systems. Particularly as far as new media is concerned, the customer's ability to use the provided interaction systems is no less important than the required technological equipment and transmission speed.

Multi-media interaction is recommended if the required perception spectrum cannot be covered by text or speech alone. The deployment of interaction systems depends not only on the problem to be supported, but also on the ability of different systems to communicate with one another. Therefore, an optimally composed portfolio allows the integration of need and available knowledge about the customer beyond a single interaction system. This allows a company to meet customers' needs speedily and to avoid redundancy (e.g. repeated input of the same data or repeated processing of a complaint lodged via different channels). The most important decision criteria when deciding between web-based, human-to-human communication and machine-supported, self-service systems are the problem complexity and the relevance of analogous communication for optimal interaction output. Web collaboration systems have to ensure a customer-satisfying accessibility level. Furthermore, their success depends on providing sufficient analogous communication elements. Although video conferences are the best substitute for face-to-face

communication, they do not only require an infrastructure (camera, bandwidth) that may be lacking, but this interaction medium itself lacks user acceptance and experience. The integration of different mono-media interaction modes (such as Internet chatting and screen sharing) is a good alternative solution, especially when the problem is well structured. However, no more than two persons should take part in a conversation within one session due to the difficulties in co-ordinating interaction when there are multiple participants (s. Garcia et al. 1999).

In the case of self-service interaction, the limited perception spectrum of the system should allow the customer to initiate a web-based, human-to-human interaction. Another criterion when choosing a self-service system should be that the system has the ability to adapt to the user, which is one of the prerequisites for a symmetric communication.

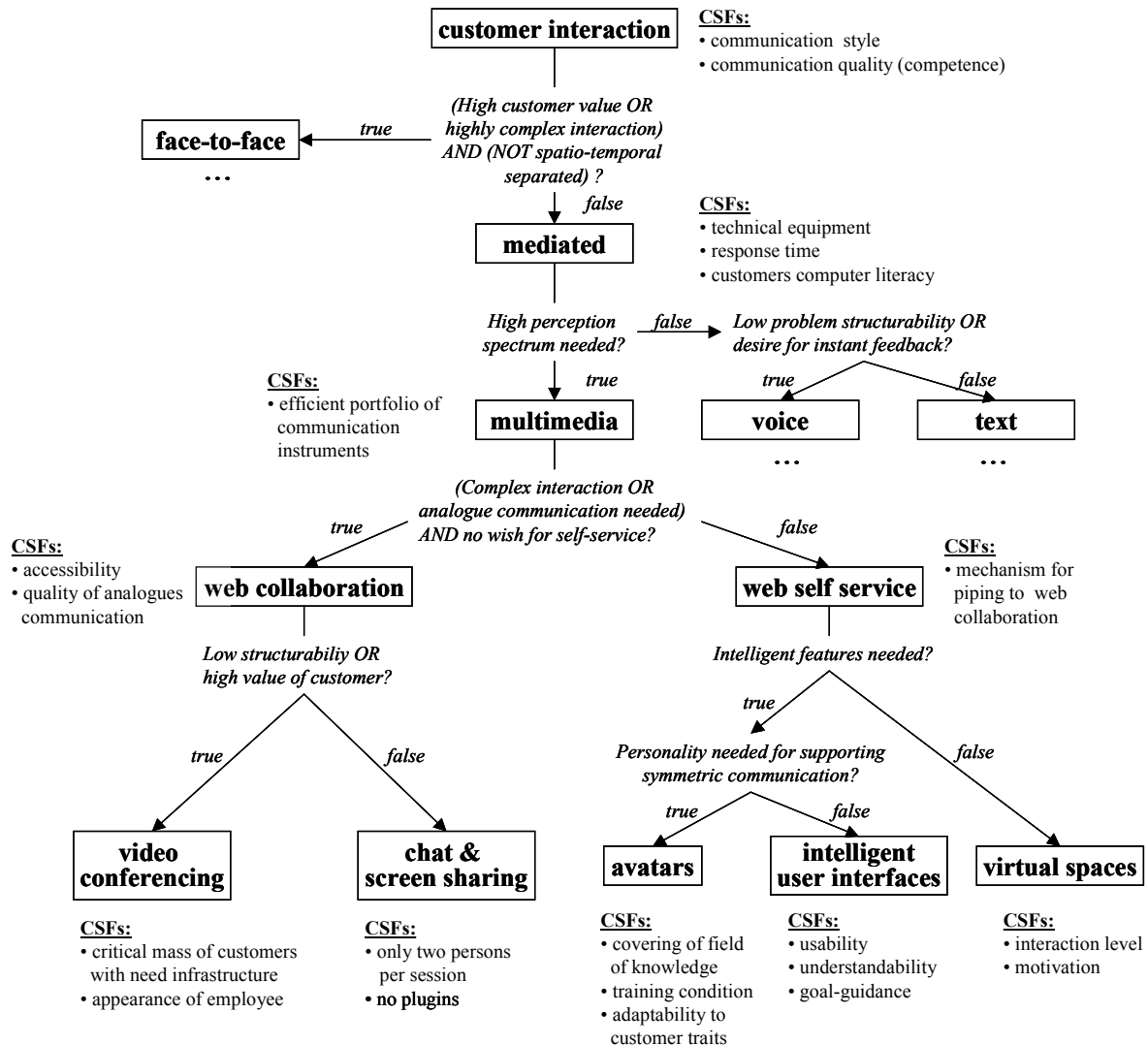


Figure 1. Customer Web Interaction Decision Tree

Conclusion and Discussion

Not only the technological capacity and the relevant costs are important for a cost-effective utilisation of interaction systems for communication between the company and its customers. The effect of the interaction system on the relational level of the communication and the potentials linked to it - as far as the establishment and operation of profitable business relations are concerned - must be the focus of interest. The effort to support the customer interaction must therefore correspond to the value

of the customer relation for the company. Furthermore, the suitability of interaction systems depends considerably on the question whether information systems can provide the necessary spectrum of perception. A broader spectrum of perception, however, does not necessarily lead to a more efficient customer interaction.

Observing the communication rules is a critical success factor when trying to support the communication between the company and its customers. The potentials of interaction systems can only be used if the speed of reaction (Watzlawiks Axiom 1) and the style of communication (Axioms 2,3,4) correspond to the customers' expectations. Procedures and organisational rules must therefore secure the customer interaction within a short span of time. Customer interactions should thus always focus on being symmetrical (Axiom 5). From the customers' point of view further criteria for the exclusion of certain interaction systems are (mainly Axiom 2): technical flaws (43%), an inappropriate user interface (36%), sub-optimal procedures (17%) or a too complex transaction (4%) (Meuter et al. 2000).

The strengths and the weaknesses of different interaction media and those supporting communication systems are to be considered by the selection of the whole interaction portfolio. Financial as well as relationship aspects should be taken into account. The available research results assume that after a personal relationship has (preferably) been established, a shift occurs towards medium-supported systems with a reduced perception spectrum.

References

- Alt, R., Fleisch, E., Österle, H. (Eds.), *Business Networking – Shaping Collaboration Between Enterprises*, 2nd Ed., Springer, Berlin et al., 2001.
- Åberg, J., and Shahmehri, N. "The role of human Web assistants in e-commerce: an analysis and usability study," *Internet Research: Electronic Networking Applications and Policy* (10:2) 2000, pp 114-125.
- Beresford, S. "Web Enabled Contact Centres," CRM Forum Resources, 1999, www.crm-forum.com, (31.09.2001).
- DaimlerChrysler AG "Guided Tour," DaimlerChrysler Germany, 2001, www.mercedes-benz.t-online.de/NASApp/portal/dcxHome?category=category02, (20.11.2001).
- Delhees, K.H. (ed.) *Soziale Kommunikation*. Lengerich, Darmstadt, 1994.
- eBay GmbH "Guided Tour," eBay GmbH, 2001, pages.ebay.de/help/basics/tours.html, (20.11.2001).
- ENEN "A community of Electronic Engineers," 2001, www.enen.com, (02.02.02).
- E-Trade "Chat with Loan Professionals," E-Trade, 2001, <http://mortgage.etrade.com/>, (15.11.2001).
- Fleisch, E., Das Netzwerkunter
- Garcia, A., and Jacobs, J. "The Eyes of the Beholder: Understanding the Turn-Taking Systems in Quasi-Synchronous Computer-Mediated Communication," *Research on Language and Social Interaction* (32:4) 1999, pp. 337-367.
- Häubl, G., and Trifts, V. "Consumer Decision Making in Online Shopping Environments: The Effects of Interactive Decision Aids," *Marketing Science* (19:1) 2000, pp. 4-21.
- Horvitz, E., and Paek, T. "Harnessing Models of User's Goals to Mediate Clarification Dialogs in Spoken Language Systems," Proceedings of the Eighth International Conference on User Modelling (UM2001), Sonthofen, Germany, 2001, pp. 3-13.
- Karmarsin, M., Winter, C., *Grundlagen des Medienmanagements*, Fink, München 2000
- Kolko, B.E. "Representing Bodies in Virtual Space: The Rhetoric of Avatar Design," *The Information Society* (15:3) 1999, pp. 177-186.
- Lengel, R., Daft, R., "The Selection of Communication Media as an Executive Skill", *Academy of Management Executive* (2:3) 1988, pp. 225-232.
- Libuda, L. "Improving clarification dialog in speech command systems with the help of user modelling: A conceptualization for an in-car user interface," LLWA 01 - Proceedings of the GI-Workshop "Lernen - Lehren - Wissen - Adaptivität", University of Dortmund, Dortmund, 2001, pp. 256-260.
- McCullough Johnston, K. "Why e-business must evolve beyond market orientation: applying human interaction models to computer-mediated corporate communications," *Internet Research: Electronic Networking Applications and Policy* (11:3) 2001, pp 213-225.
- McQuail, D., Windahl, S., *Communication models for the study of mass communications*, 6th Ed., Longmann, London, New York, 1999
- Meuter, M., Ostrom, A., Roundtree, R., and Bitner, M. "Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters," *Journal of Marketing* (64:July) 2000, pp 50-64.
- Microsoft "Online Seminars for Partners," 2001, www.microsoft.com/germany/partner/onlineSeminar/default.asp, (22.11.2001).
- MIT "Segue – Bringing History to Light," 2001, sibyl.www.media.mit.edu/people/sibyl/projects/segue/index1.html, (05.06.01).

- Morkes, J., Kernal, H.K., and Nass, C. "Effects of Humor in Task-Oriented Human-Computer Interaction and Computer-Mediated Communication: A Direct Test of SRCT Theory," *Human-Computer Interaction* (14) 1999, pp. 395-435.
- Morrell, S. *Benchmarking Customer Services Technology: How companies are embracing their customers* Reuters Business Insight, London, 2000.
- Mühlfelder, M., Klein, U., Simon, S., and Luczak, H. "Teams without trust? Investigations in the influence of video-mediated communication on the origin of trust among cooperating persons," *Behavior & Information Technology* (18:5) 1999, pp. 349-360.
- Nass, C., and Lee, K.M. "Does Computer-Synthesized Speech Manifest Personality? Experimental Tests of Recognition, Similarity-Attraction, and Consistency-Attraction," *Journal of Experimental Psychology: Applied* (7:3) 2001, pp. 171-181.
- Nicol, J., and Watson, K. "Videotutoring, non-verbal communication and initial teacher training," *British Journal of Educational Training* (31:2) 2000, pp. 135-144.
- Nwana, H. "Software Agents: An Overview," *Knowledge Engineering Review* (11:3) 1996, pp. 1-40.
- Österle, H. "Enterprise in the Information Age," in: *Business Networking: Shaping Collaboration Between Enterprises*, H. Österle, E. Fleisch and R. Alt (eds.), 2nd edition, Springer, Berlin etc., 2001, pp. 17-54.
- Österle, H., Brenner, W., and Hilbers, K. *Total Information Systems Management* John Wiley & Sons, Chichester, 1993.
- Purdy, J.M., Nye, P., and Balakrishnan, P.V. "The impact of communication media on negotiation outcomes," *International Journal of Conflict Management* (11:2) 2000, pp. 162-187.
- Read, J. "For Success, Building a Customer-Centric Strategy is Key: Few companies focusing on both collaboration and customer loyalty," *Electronic News* (46:42) 2000, p. 54.
- Sauer, J., Schramme, S., and Rüttinger, B. "Knowledge acquisition in ecological product design: the effects of computer-mediated communication and elicitation method," *Behavior & Information Technology* (19:5) 2000, pp. 315-327.
- Schultz, D.E., and Bailey, S. "Customer/Brand Loyalty in an Interactive Marketplace," *Journal of Advertising Research* (May/June 2000), pp. 41-52.
- Ulrich, H. *Management* Haupt, Bern, 1984.
- Wagner, T. "Multichannel Customer Interaction," Accenture, 2000, www.crmproject.com/documents.asp?d_ID=736, (13.07.2001).
- Watzlawik, P., Beavin, J.H., and Jackson, D.D. *Pragmatics of Human Communication : A Study of Interactional Patterns, Pathologies, and Paradoxes* W. W. Norton & Company, New York, London, 1967.
- Wigand, R.T., Picot, A., and Reichwald, R. *Information, Organization and Management: Expanding Markets and Corporate Boundaries* Wiley & Sons, New York et al., 1997.